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SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER

EWALD, MARIA VERONICA

ART UNIT	PAPER NUMBER
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1722

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/750,534

Applicant(s)

DAVISON ET AL.

Examiner

Maria Veronica D. Ewald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 13-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 23-26 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/19/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

13. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-12 and 23-26, drawn to an article or "apparatus", classified in class 425, subclass 299.
- II. Claims 13-22, drawn to methods of making and substrate, classified in class 264, subclass 293.

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by another and materially different process, such as by forging a multilayered blank.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, recognized divergent subject matter, and because the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

During a telephone conversation between Examiner Matthew Daniels and Mr. Charles Steffey on 14 December 2005, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-12 and 23-26. Affirmation of this election must be made by applicant in replying to this Office action. Claims 13-22 are withdrawn

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from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

14. The drawings are objected to because the lines, numbers and letters are not uniform, clean and well defined (of a generally poor quality) in each of the fourteen figures (37 CFR 1.84(l)). Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Specification

15. The disclosure is objected to because of the following informalities: Page 1 of the Specification includes a section entitled "Related Application." The application referenced in this section, is this application and thus, this section in the specification should be deleted. Appropriate correction is required.

Claim Objections

16. Claim 2 is objected to because of the following informalities: As written, claim 2 states "...a layer of metal nitride deposited over the layer of metal nitride." Examiner is interpreting this phrase as "...a layer of metal nitride deposited over the layer of metal oxide." Examiner believes this is a misprint and requires correction and/or clarification.

Claim Rejections - 35 USC § 112

17. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 7 and 9 – 10 contain the trademark/trade name Parylene Nova HT. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe the second coating on the substrate and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 102

18. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by DePuydt, et al. (U.S. 6,030,556). DePuydt, et al. teach an apparatus comprising an embossing tool substrate made of a first metal, a first major surface of the substrate having an embossing profile (item 42 – figure 4; column 1, lines 15 – 20; column 7, lines 1 – 5); a first coating over the first major surface of the substrate, the first coating providing an adherable surface (column 7, lines 10 – 15); and a second coating over the first coating, the second coating providing a non-adhesive outer surface (column 7, lines 59 – 65); wherein the first coating is further comprised of three layers (a dielectric layer and a patterning layer comprised of two distinct layers), wherein there is a first layer of a second metal deposited over the embossing tool substrate (column 7, lines 28 – 31, 45 – 50); a subsequent layer over the base layer of second metal (column 5, lines 25 – 35, 58 – 60); and the third layer (column 5, lines 58 – 60). Furthermore, the second coating, also known as the cap coating or cap layer is provided to reduce or prevent disruptions to the planarity of the patterning material layers of the first coating (column 7, lines 60 – 65). DePuydt, et al. further teach that the layers of the individual layers depends on the desired pit depth in the discs to be stamped or formed (column 6, lines 60 – 65).

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Claims 1 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohman, et al. (U.S. 6,454,970). Ohman, et al. an apparatus comprising an embossing tool substrate made of a first metal (item 2 – figure 14; column 1, lines 5 – 10; column 3, lines 30 – 40; column 12, lines 39 – 42, 50 – 55), a first major surface of the substrate having an embossing profile (column 12 lines 30 – 35); a first coating over the first major surface of the substrate, the first coating providing an adherable surface (item 61 – figure 14; column 13, lines 25 – 30); and a second coating over the first coating, the second coating providing a non-adhesive outer surface (item 7 – figure 14; column 19, lines 15 – 30); wherein the apparatus is further comprised of a heater apparatus and a pressure apparatus (column 9, lines 5 – 10; column 11, lines 8 – 12).

Claims 23 – 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohman, et al. Ohman, et al. teach an apparatus comprising: an embossing tool that includes: a tool substrate base (item 2 – figure 14; column 1, lines 5 – 15; column 19, lines 5 – 10); and means attached to the tool substrate base for providing a hardened embossing surface with reduced adherence properties to an embossable substrate (column 19, lines 4 – 10, 17 – 22); wherein the apparatus is further comprised of means for providing an embossable surface including a polymer film having attached thereto means for releasing the embossing tool, mixed with an epoxy resin (column 19, lines 5 – 10, 19 – 21).

Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 – 3 and 5 – 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over DePuydt, et al. in view of Ohman, et al. and further in view of Imatomi (U.S. 2006/0051453 A1). DePuydt, et al. teach the characteristics previously described but do not teach that the second and third base layers of the first coating are a metal oxide and metal nitride, specifically zirconium oxide and zirconium nitride nor does DePuydt, et al. teach the thicknesses of each layer. DePuydt, et al., however, do disclose the substrate with its multi-layered coating, such that the coating layers range in thickness from 10 – 200 nm. It is, therefore, known to one of ordinary skill in the art to apply metal or metal alloys in the formation of a substrate tool in layers and to ensure that such layers are very thin.

For example, Ohman, et al. teach the use of a three-layered substrate, comprised of a base metal layer, a thin layer of a second metal with good electrical characteristics, and a hard, wear-resistant layer, providing good release characteristics when contacted against the plastic element to be embossed (column 19, lines 15 – 25). The outermost wear-resistant layer consists of up to 5 micrometers (μm) of titanium nitride. In addition, Ohman, et al. teach that the respective layers should be fairly thin ($< 20 \mu\text{m}$ or between 2 – 10 μm) to produce optimum results (column 18, lines 10 – 13).

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Furthermore, though the Applicant has claimed the specific thicknesses of 0.5 μm and 2 – 9 μm , the Applicant has not introduced specific reasoning for utilizing such thicknesses. On the other hand, Ohman, et al. has stated that practically, very thin layers produce optimum results. Therefore, one of ordinary skill in the art would conclude that optimum results and higher quality substrates are produced with thinner layers.

Furthermore, in a method to manufacture a metal mold device, Imatomi teaches that components of the mold may be produced with layers (paragraph 0090), wherein there is a base layer, an inner layer and an outermost layer. The inner and outermost layers may be made of zirconium oxide and/or zirconium nitride among other metal compounds that may be used. The use of zirconium nitride and oxide provides good wear-resistant characteristics and toughness (paragraph 0091).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the layered substrate of DePuydt, et al. with the zirconium oxide and zirconium nitride layers of Imatomi, et al., and ensuring that the layers are very thin, as taught Ohman, et al. for the purposes of providing layers, with toughness and good wear-resistance as taught by Imatomi and producing optimum results as taught by Ohman, et al.

Claims 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over DePuydt, et al. in view of Cheung, et al. (U.S. 6,210,514). DePuydt, et al. teach the

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characteristics previously described but do not teach that the second coating is comprised of polyparaxylylene.

In a method to fabricate thin film structures onto a substrate, Cheung, et al. teach the use of dielectric deposition of parylene C (paraxylylene), of 5 μm thick, onto the substrate (column 11, lines 35 – 37). The dielectric deposition of such a coating enhances moisture and chemical barrier properties of the finished assembly (column 11, lines 43 – 45).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to use paraxylylene as the cap layer or second coating in the multi-layered stamper of DePuydt, et al. for the purpose of maintaining the integrity and chemical properties of the patterning layer in the first coating.

Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over DePuydt, et al. in view of Ohman, et al., further in view of Imatomi and further in view of www.stcsm.gov.cn - "Light Duty: Managing MOEMS" (July 19, 2001). DePuydt, et al., Ohman, et al. and Imatomi teach the characteristics previously described but do not teach that the second coating is comprised of parylene Nova HT.

In the above-listed article on the fabrication of micro-optoelectromechanical (MOEMS) systems, the use of parylene Nova HT is discussed. In MOEMS packaging, nanoscale devices can be easily damaged due to atmospheric contaminants such as moisture and other miniscule particles. Moisture creates a larger problem, causing "stiction" in which surfaces can get locked together and thus, to deter surfaces from

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getting warped due to water vapor, surfaces are applied with a thin coating. To this end, parylene Nova HT is used (page 1). This is similar to the advantages provided by the cap layer of DePuydt, et al. DePuydt, et al. teach that the cap layer maintains the integrity of the patterning layers underneath and does not mix with such layers, and therefore, maintains the chemical properties of such inner layers (DePuydt, et al., column 7, lines 60 – 65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the multi-layered coated substrate of DePuydt, et al., with the thicknesses of Ohman, et al. and the zirconium oxide and nitride of Imatomi, to further include parylene Nova HT as the cap layer in the multi-coated substrate of DePuydt, et al. for the purpose of maintaining the integrity of the patterning layers underneath and not mixing with such layers.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over DePuydt, et al. in view of www.stcsm.gov.cn - "Light Duty: Managing MOEMS" (July 19, 2001). In the above-listed article on the fabrication of micro-optoelectromechanical systems (MOEMS), the use of parylene Nova HT is discussed. In MOEMS packaging, nanoscale devices can be easily damaged due to atmospheric contaminants such as moisture and other miniscule particles. Moisture creates a larger problem, causing "stiction" in which surfaces can get locked together and thus, to deter surfaces from getting warped due to water vapor, surfaces are applied with a thin coating. To this end, parylene Nova HT is used (page 1). This is similar to the advantages provided by the

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cap layer of DePuydt, et al. DePuydt, et al. teach that the cap layer maintains the integrity of the patterning layers underneath and does not mix with such layers, and therefore, maintains the chemical properties of such inner layers (DePuydt, et al., column 7, lines 60 – 65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to use parylene Nova HT as the cap layer in the multi-coated substrate of DePuydt, et al. for the purpose of maintaining the integrity of the patterning layers underneath and not mixing with such layers.

Claim 12 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohman, et al. in view of Imatomi. Ohman, et al. teach the characteristics previously described but do not teach that the coatings are comprised of zirconium and zirconium nitride, respectively. Ohman, et al. do teach, however, that the base metal layer or substrate is coated with a thin layer of a second metal with good electrical characteristics, and a hard, wear-resistant layer, providing good release characteristics when contacted against the plastic element to be embossed (column 19, lines 15 – 25). The outermost wear-resistant layer consists of up to 5 micrometers (μm) of titanium nitride. In addition, Ohman, et al. teach that the respective layers should be fairly thin ($< 20 \mu\text{m}$ or between $2 - 10 \mu\text{m}$) to produce optimum results (column 18, lines 10 – 13).

In a method to manufacture a metal mold device, Imatomi teaches that components of the mold may be produced with layers (paragraph 0090), wherein there is a base layer, an inner layer and an outermost layer. The inner and outermost layers

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may be made of zirconium oxide and/or zirconium nitride among other metal compounds that may be used. The use of zirconium nitride and oxide provides good wear-resistant characteristics and toughness (paragraph 0091).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the layered substrate of Ohman, et al. with the zirconium oxide and zirconium nitride layers of Imatomi, for the purposes of providing layers with toughness and good wear-resistance as taught by Imatomi.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohman, et al. in view of Imatomi and further in view of Cheung, et al. Ohman, et al. and Imatomi teach the characteristics previously described but do not teach that there is a further coating comprised of polyparaxylylene.

In a method to fabricate thin film structures onto a substrate, Cheung, et al. teach the use of dielectric deposition of parylene C (paraxylylene), of 5 μm thick, onto the substrate (column 11, lines 35 – 37). The dielectric deposition of such a coating enhances moisture and chemical barrier properties of the finished assembly (column 11, lines 43 – 45).


Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the multi-layered coated substrate of Ohman, et al. with the zirconium oxide and nitride layers of Imatomi to further include an outer layer of paraxylylene as for the purpose of maintaining the integrity and chemical properties of the patterning layer in the first coating.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Veronica D. Ewald whose telephone number is 571-272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


JOSEPH S. DEL SOLE
PRIMARY EXAMINER
5/6/06

MVE